NEW DATA ON ANTILLEAN SCARABAEINE BEETLES, AND TWO NEW SPECIES FROM HISPANIOLA

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The author has recently been able to examine material in the Museum of Comparative Zoology (MCZ) collected by Dr. P. J. Darlington, Jr., in Cuba in the 1920's and 1936, and Hispaniola in 1934 and 1938. The canthonines among this material were previously on loan to another specialist and could not be examined during the author's preparation of his revision of the Scarabaeinae of the Antilles (Matthews, 1966). Included are three undescribed species of *Canthochilum* from Hispaniola, where the genus was previously thought to be absent. Two of these species are here described, and the opportunity is taken to note some new distribution records and corrections, make some nomenclatorial changes, comment on some type material in European and Australian museums recently visited, and discuss some new generic names proposed by Vulcano and Pereira (1966).

Species and genera for which new data are available are discussed below in the same order as in the author's revision (Matthews, 1966).

Onthophagus albicornis Palisot, 1805.

A previously unrecorded locality for the subspecies *albicornis* Palisot is: Cap Haitien, on the north coast of Haiti. For the subspecies *capitatus* Laporte, 1840: N.E. foothills La Hotte, Grande Rivière, Ennery, Mt. Trou d'Eau, Diquini, St. Marc, Manneville, N. of Dessalines, and Camp Perrin, all in Haiti. This shows that *capitatus* occurs northward along the west coast of Haiti at least as far as Dessalines, while *albicornis* (widespread in the Dominican Republic) occurs westward along the north coast of Haiti. The two must meet somewhere on Cap St. Nicolas, and specimens collected there will decide whether we are dealing with two subspecies or two species. Intermediates have still not been seen.

Oniticellus cubiensis Laporte, 1840.

The type series of this species could not be found in the Paris

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Museum (nor could any Laporte material), but two specimens from Cuba are present in the Laporte de Castelnau Collection in the National Museum of Victoria, Melbourne. In view of the apparent loss of Laporte types in Paris, it is well to point out the availability of the Melbourne collection in cases of doubt. Since no specific specimens were designated as holotypes in Laporte's day, the Melbourne specimens could in some cases be designated lectotypes. Not all Laporte species are represented in the Melbourne collection, as this was his "secondary" series kept after the "primary" one was sold (Horne and Kahle, 1937). A quick survey uncovered 23 of Laporte's own species in the subfamily Scarabaeinae alone.

Uroxys productus Arrow, 1933.

As previously noted (Matthews, 1966:55), although the origin of the type is unknown, this name was given to a species from Guadeloupe by Paulian (1939) and the present author followed this usage, assuming that Paulian had compared the specimens directly. However, on examining the type of *U. productus* Arrow in the British Museum the author found enough differences between it and the description of the Guadeloupe specimens previously seen (Matthews, 1966:54-55) to cast doubt on the identity of the latter with *productus*. He would have let the matter go until direct comparison was possible between *productus* and a Guadeloupe specimen, except that in the meantime Balthasar (1966) redescribed the Guadeloupe species under a new name, unaware that a species of *Uroxys* had already been recorded from Guadeloupe and that it had been given the name *productus* Arrow. The introduction of a new name in the literature forces an immediate decision, even though the information at hand is inadequate. In view of the above-mentioned doubts regarding the conspecificity of the Guadeloupe species and *productus* (which concern mainly the depth and punctuation of the elytral striae and some other minor features), it is best for the moment to give the Guadeloupe species Balthasar's new name and to return the name *productus* to a species of unknown origin, represented by the unique type in the British Museum. Final determination of the problem must await a direct comparison between a Guadeloupe specimen and this type. The following synonymy is therefore suggested, subject to change:

Uroxys guadeloupensis Balthasar, 1966

Uroxys guadeloupensis Balthasar, 1966, Entomol. Blätter 62:182-183.
Uroxys productus auct. (*nec* Arrow, 1933, Ann. Mag. Nat. His., Ser. 10,

11:389); Paulian, 1939, Psyche 46:141; Paulian, 1947, Coléoptères des Antilles 1:32; Matthews, 1966, Mem. Am. Entomol. Soc., no. 21, p. 54.

Genus *Canthochilum* Chapin, 1934.

Simultaneously with the appearance of the author's revision (Matthews, 1966) there appeared another revision of the Autillean Canthonina by Vulcano and Pereira (1966), based largely on the MCZ material. In the latter work, the authors restrict the name *Canthochilum* to its type species from Puerto Rico (*oakleyi* Chapin), erect another monotypic genus *Chapincanthon* for the Puerto Rican *hispidum* Chapin, and place the three remaining species they recognize, from Puerto Rico, Cuba, and Hispaniola, in the new genus *Antillacanthon*.

The separation of *Canthochilum* sensu stricto is based on a supposed sclerite (or "piece") separating the lateral lobe of the metasternum from the mid coxa (Vulcano and Pereira, 1966:136, fig. 57). This piece is in fact not a sclerite but the widened margin of the mid-coxal cavity and therefore part of the metasternum itself, from which it cannot be separated (compare Matthews, 1965:460, fig. 15, msc). Some species of *Uroxys* have a similar widened mid-coxal margin.

The separation of *Chapincanthon* is based on the covering of clavate hairs which hold a layer of soil on *C. hispidum,* its posterior elytral tubercles, its reduced hind wings, and a number of additional features which are actually shared with other species.

The features mentioned, while unusual, are considered by the present author to be superficial modifications superimposed on a basic plan which is common to all of the species of *Canthochilum*. This basic plan, or generic conception, has been presented before as the description of the genus (Matthews, 1966:60; Zayas and Matthews, 1966:2) and need not be repeated here.

Therefore, the present author considers *Antillacanthon* Vulcano and Pereira and *Chapincanthon* Vulcano and Pereira to be subjective synonyms of *Canthochilum* Chapin.

Among the Cuban and Hispaniolan *Canthochilum* examined by Vulcano and Pereira (1966) were a number of then undescribed species to which they assigned the names *histeroides* Harold, 1868, and *gundlachi* Harold, 1868. In fact, these two species were not represented in the MCZ material subsequently examined by the author. This material contains some Cuban species recently described by Zayas and Matthews (1966) and the three undescribed Hispaniolan species discussed below.

When writing his revision, the author (Matthews, 1966) believed that *Canthochilum* either did not exist on Hispaniola, or was "reduced to as-yet-undiscovered pockets", since he did not get it during his five-day visit there. In this he proved to be wrong on all counts. Not only does it occur there, but there are at least three species, one of which is fairly widespread. Furthermore, the "pockets" were not undiscovered, but had been sampled by Dr. P. J. Darlington in 1934 and 1938 (this material was not previously available to the author).

Two of the species are described below. The third cannot be named at present as it is represented by only half a specimen, and while this actually presents enough characters for diagnosis, it is not desirable to establish a fragment as a holotype. The following descriptions are diagnostic and do not repeat generic characteristics or those not previously found to be useful in separating species.

Canthochilum darlingtoni, new species.

Description.-Oval, feebly convex, piceous to fuscous (one teneral specimen yellow), shiny, antennae and legs fuscous. Head.- Clypeal margin with four small teeth and an angulation at clypeo-genal suture. Dorsal ocular areas large, separated by a distance equal to 3 times their width (fig. 1). Head surface entirely smooth, uniformly very finely and sparsely punctate. Thorax.- Pronotum entirely smooth, shiny, uniformly very finely and sparsely punctate. Elytra moderately convex, intervals absolutely flat and extremely finely punctate, shiny. Striae indistinct, not at all impressed, very finely punctate except for 8th stria, which is coarsely punctate. Lateral carina alongside 7th stria extending for about ¾ of elytral length, not continued as a ridge posteriorly. Fully winged. Underside impunctate, faintly shagreened. Meso-metasternal suture obtusely angulate in the middle. Inner mid-coxal margin on median lobe of metasternum narrow, curving inward anteriorly to meet meso-metasternal suture at a very obtuse angle. Outer mid-coxal margin uniformly narrow, paralleling edge of coxal cavity. Fore tibiae with distal edge straight, perpendicular to inner edge (fig. 2). Abdomen.- Sternites of approximately equal length along mid-line. Pygidium entirely margined, the disc convex, smooth and very finely punctate. Aedeagus with parameres triangular, basal piece with flattened ventral extension (fig. 4). Total length.- 3.0 — 4.2 mm.

Sexual dimorphism.- Major males have a widened prothorax, which thus has its lateral margins almost parallel; minor males and females have the lateral edges converging anteriorly. All males have a some-

what sinuate inner margin of the fore tibiae and blunt fore spurs (fig. 2), while the hind femora are widened and the hind tibiae slightly more curved (fig. 3).

Type.- Sánchez, Dominican Republic, July 1938, P. J. Darlington, MCZ.

This species is most closely related to the Cuban *C. histeroides* (Harold) with which it shares the number of clypeal teeth, shape of the fore tibiae, widened male fore spur and pronotum, and smoothness of dorsal surfaces. It differs in not having the middle teeth of the clypeus very slender as in that species, in having the inner mid-coxal margin curving inward anteriorly, in size, the Cuban species being somewhat larger, and above all in the shape of the aedeagus, which is entirely different (compare fig. 4 here with fig. 75 in Matthews, 1966:68). The aedeagus is quite similar to that of the Cuban *C. pijirigua* Zayas and Matthews (Matthews, 1966:68, fig. 73), which is entirely different externally, while the sexual dimorphism in the fore and hind legs is a feature shared only with Puerto Rican species.

The 30 specimens which form the basis for this description were determined as *histeroides* Harold by F. S. Pereira. However, in their description under this name, Vulcano and Pereira (1966:147-151) do not mention or cite these Hispaniolan specimens and give the distribution as Puerto Rico only, although on their map (op. cit.:116) they indicate it to occur on Hispaniola as well. Not mentioned or indicated is the fact that Cuba is the type locality of the name. Apparently, their detailed description of *"histeroides"* is based on specimens of the Puerto Rican *C. taino* Matthews only. The type of *histeroides* in Paris has been examined by the author, as previously reported (Zayas and Matthews, 1966).

The author is pleased to name this species after Dr. P. J. Darlington, Jr., its collector.

Paratypes.- DOMINICAN REPUBLIC: Sánchez [Province of Samaná, on the northeast coast], July 1938, P. J. Darlington, 27 specimens (MCZ); Mt. Quita-Espuela [Province of Duarte],

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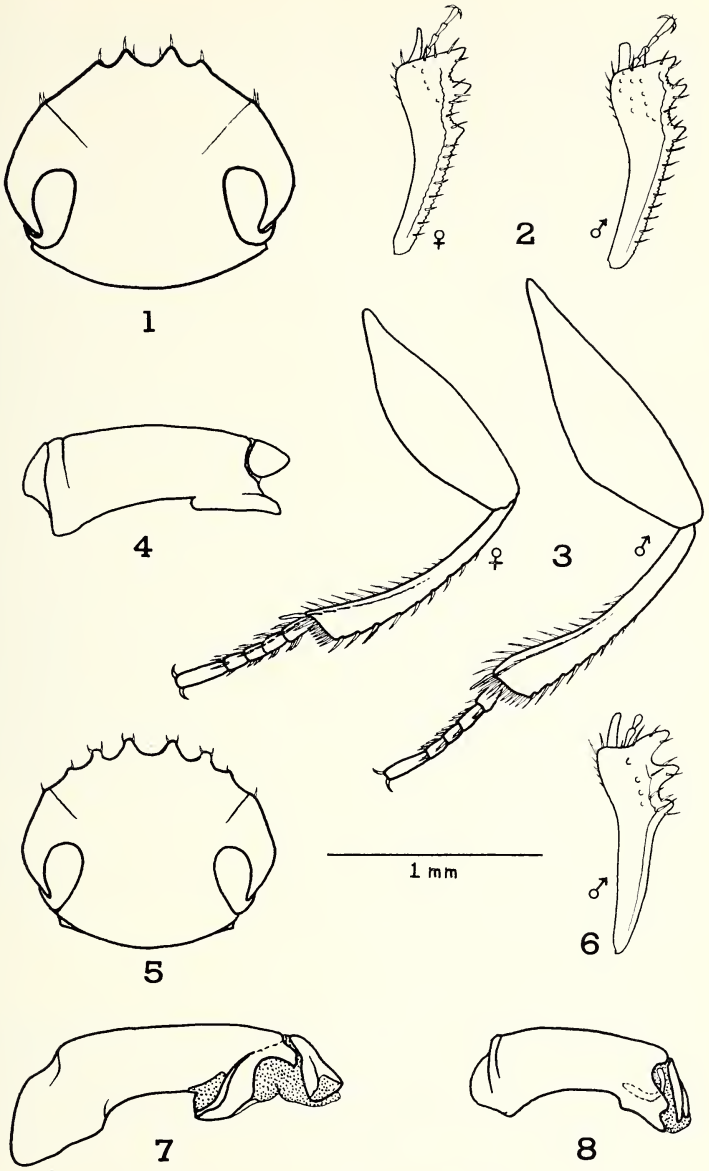
EXPLANATION OF PLATE 1

Figs. 1-4, *Canthochilum darlingtoni* n. sp. Fig. 1, outline of head in dorsal view; fig. 2, right fore tibia and tarsus in dorsal view; fig. 3, left hind femur, tibia, and tarsus in ventral view; fig. 4, aedeagus from side. Figs. 5-7, *Canthochilum ciboney* n. sp. Fig. 5, outline of head in dorsal view; fig. 6, right front tibia in dorsal view; fig. 7, aedeagus from side, membranes stippled. Fig. 8, unnamed Haitian species of *Canthochilum,* aedeagus from side.



MATTHEWS — CANTHOCHILUM

2—3,000 ft, July 1938, P. J. Darlington, 1 specimen (MCZ); Villa Altagracia [Province of San Cristóbal, low elevation], July 1938, P. J. Darlington, 1 specimen (MCZ).

Canthochilum ciboney, new species.

Description.- Oval, feebly convex, piceous, shiny, antennae and legs rufous. Head.- Clypeal margin with six small teeth and an additional tooth at clypeo-genal suture (the so-called "octodentate" condition). Dorsal ocular areas large, separated by a distance equal to 3 times their width (fig. 5). Head surface entirely smooth, shiny, uniformly moderately punctate. Thorax.- Pronotum entirely smooth, shiny, uniformly very finely punctate. Elytra moderately convex, intervals flat and finely shagreened, impunctate. Striae distinctly impressed and remotely punctate. Lateral carina alongside 7th stria extending for about ¾ of elytral length, not continued as a ridge posteriorly. Fully winged. Underside impunctate, slightly shagreened. Meso-metasternal suture obtusely angulate in the middle. Inner mid-coxal margin on median lobe of metasternum broadening anteriorly, meeting meso-metasternal suture at a moderately obtuse angle. Outer mid-coxal margin uniformly narrow, paralleling edge of coxal cavity. Fore tibiae with distal edge angulate, bending outward at insertion of first tooth (fig. 6). Fore spur blunt. Abdomen.- Last sternite longer than others along mid-line, as long as previous two combined. Pygidium entirely margined, the disc flat, smooth and finely punctate. Aedeagus with parameres unequally sclerotized, basal piece distally excavated with posteriorly directed projection (fig. 7). Total length.- 4.0 mm.

Sexual dimorphism.- Probably confined to the fore spur, which is blunt in the unique male, and perhaps the prothorax, which is nearly always slightly widened anteriorly in the males of this genus. The legs show no dimorphic modifications.

Type.- Mt. Trou d'-Eau, Haiti, 19 November 1934, P. J. Darlington, unique male, MCZ.

This species is most closely related to the Cuban *C. pijirigua* Zayas and Matthews, especially the latter's "form 1" (Matthews, 1966:71), from which it scarcely differs externally, being only a little more finely punctate and more pronouncedly octodentate. However, the aedeagus is entirely different (compare fig. 7 here with fig. 73 in Matthews, 1966:68) and unlike that of any other species examined.

The single known specimen was determined as *Antillacanthon gundlachi* (Harold), a Cuban species, by Vulcano and Pereira

(1966:143-144) and described in detail by them under that name. The type of *gundlachi* has been examined by the present author. It is also octodentate, but has a much coarser dorsal punctuation, the punctures of the pronotum especially running together to form grooves. Furthermore, it has a pair of low transverse ridges on the head, absent in *ciboney,* and the elytral intervals are more convex. The aedeagus of *C. gundlachi* has not been examined.

The two described species of Hispaniolan *Canthochilum* may be told apart at a glance by the shape of the head (figs. 1 and 5), also the distal edge of the fore tibiae (fig. 2 and 6), the shagreening of the elytra and deeper striae in *ciboney,* the latter's lengthened last sternite, and, of course, the male genitalia.

In keeping with a previous tradition in describing species of this genus, the new species is given an Amerindian name and is dedicated to the Ciboney tribe, which occupied part of Hispaniola and Cuba.

The third Hispaniolan species of *Canthochilum* in the MCZ material is represented by the hind body of a single male. It is a typical *Canthochilum,* judging by the sternal plates, lateral elytral carinae, and aedeagus, but is clearly different from either *darlingtoni* or *ciboney* in having the elytral intervals more strongly shagreened, the striae coarser, the elytra a little more flattened, and the aedeagus quite different, with slender parameres and a trilobed projection on the basal piece (fig. 8). The aedeagus is unlike that of any Cuban or Puerto Rican species known. The total length of the beetle is estimated at 3.3 mm.

Material examined.- Etang Lachaux, S.W. peninsula of Haiti, under 1,000 ft, 26-27 October 1934, P. J. Darlington, ½ specimen, MCZ.

New localities for previously known species of *Canthochilum* are as follows.

Canthochilum anacaona Zayas and Matthews, 1966

Mountains north of Imias, eastern Oriente, Cuba, 3-4,000 ft, 25-28 July 1936, P. J. Darlington, 1 specimen, MCZ. Previously known from the Yunque de Baracoa and Sierra de Cristal, also in extreme eastern Oriente but on different mountain ranges.

Canthochilum tureyra Zayas and Matthews, 1966

Pico Turquino, Oriente, Cuba, south side 1-3,000 ft, June 1936, P. J. Darlington, 1 specimen, MCZ. Previously known from Loma

del Gato, some 50 miles to the east on the same south coast mountain range, where it was also collected by Darlington (3-7 July 1936, c. 3,000 ft, 3 specimens, MCZ).

Canthochilum hispidum hispidum Chapin, 1935

A fine series of 98 specimens was collected on Cerro Doña Juana, Toro Negro State Forest, Puerto Rico, on 28 December 1966 by Mr. S. Peck of Harvard University at 900 m (7 specimens) and 1,000 m (91) elevation, using rotten liver as bait (MCZ). Although the present author set excrement traps in this area, he did not get *C. hispidum* here (getting it about 7 mi to the west on Cerro de Punta). The present series shows sufficient variation not to be clearly ascribable either to the subspecies *hispidum* Chapin or *serropunctae* Matthews, and indicates that we are probably dealing with a cline running from east to west on the Cordillera Central at altitudes of about 3-4,000 ft. Consequently, it is here proposed to eliminate the subspecies *serropunctae* Matthews as a formal category and recognize only two subspecies: *hispidum* Chapin, 1935, showing clinal variation on the Cordillera Central, and *iunceanum* Matthews, 1965, occupying isolated mountain ranges in the east (Sierra de Cayey and Sierra de Luquillo).

The fact that these specimens came to liver bait supports previous indications (Matthews, 1965:458) that this species is partly necrophagous.

The total number of described species of *Canthochilum* now stands at 15, plus one unnamed species on Hispaniola and one subspecies on Puerto Rico, as follows.

CUBA.- Eight species. Described by Harold, 1868: *gundlachi* and *histeroides;* by Zayas and Matthews, 1966: *anacaona, baracutey, cemi, guayca, pijirigua,* and *tureyra.*

HISPANIOLA.- Three species. Described herein: *darlingtoni* and *ciboney*, plus one unnamed.

PUERTO RICO.- Five species. Described by Chapin, 1934, 1935: *andyi, hispidum,* and *oakleyi;* by Matthews, 1965, 1966: *borinquensis, taino,* and the subspecies *hispidum iunceanum* and *h. serropunctae,* of which only the former is now considered valid.

The total known taxa of Scarabaeinae from Hispaniola has now been raised from the previous three genera and six species (Matthews, 1966) to four genera and nine species (one unnamed) by the new recordings of *Canthochilum,* possibly ten species if *Onthophagus albicornis* and *capitatus* prove to be specifically distinct (see above).

Genus *Canthonella* Chapin, 1930

This genus was recently redescribed in detail and its affinities discussed by Halffter and Martínez (1967). They showed that the genus *Ipselissus* Olsoufieff, of Brazil and Northern Argentina, is extremely closely related to *Canthonella,* sharing even the very unusual form of the male genital capsule. *Canthonella,* therefore, is not as isolated taxonomically as the present author believed and is not of direct Holarctic origin in the Hemisphere. *Canthonella* and *Ipselissus* may be imagined to be now-localized relicts of a once-widespread Neotropical genus.

Less easy to explain is the similarity of both these genera to the genera *Sauvagesinella* Paulian of Southwestern Australia and *Nesovinsonia* Martínez and Pereira of Mauritius, described by Halffter and Martínez (op. cit.) and previously hinted at by the present author (Matthews, 1966:76). The genus *Sauvagesinella* needs to be redescribed in detail, a task which the present author will accomplish in his current revision of the Australian Scarabaeinae, during which affinities with Neotropical groups will also be examined.

Canthonella pygmaea (Harold, 1869).

The lost type of *Canthon pygmaeus* Harold was found by the author quite by accident in an unmarked box in the Paris Museum. This box contained numerous American canthonine specimens, including a number of unique types, removed from the René Oberthür collection, probably by R. Paulian. The other types found will be reported on by G. Halffter and A. Martínez in their current revision of the American Canthonina.

The type of this name belongs in fact to the Cuban species which has gone under the name previously (Zayas and Matthews, 1966; Matthews, 1966) and therefore presents no surprises. It bears the label, in Harold's own handwriting: "*pygmaeus* typ. Harold". It has now been placed in the Collection Générale near the types of *histeroides* and *gundlachi* (now in *Canthochilum*).

Vulcano and Pereira (1966:120-122) cite *Canthonella pygmaea* as occurring in Puerto Rico and Hispaniola, as well as Cuba. The Hispaniolan specimen on which they base this record has been examined by the present author and found to be *Canthonella constans* Matthews (mentioned below). The two supposed Puerto Rican specimens have not been seen by the author, but a total of 184 specimens of *Canthonella,* collected from all over the island of Puerto Rico, has been examined and all are *C. parva* Chapin. If the two specimens cited by Vulcano and Pereira are indeed *pygmaea,* then it

is likely that they have been mislabelled. This species is exclusively Cuban, as far as we know.

Canthonella constans Matthews, 1966.

New locality record: Cloudforest, vicinity Valle Nuevo, Dominican Republic, August 1938, c. 6,000 ft, P. J. Darlington, 1 specimen, MCZ. This is very nearly, or perhaps exactly, the same location where the author collected his series, which was at 11 km south of Constanza, 5,700 ft, October 1964. Valle Nuevo itself is 21 km south of Constanza.

The same specimen was cited by Vulcano and Pereira (1966:122) as *Canthonella pygmaea.* The two species are quite different (see Matthews, 1966, key pp. 76-77, etc.).

Canthon perseverans Matthews, 1966.

The British Museum collection has two specimens of this Grenadan species, found among the unclassified material and labelled "Trinidad". They were entered as part of the Fry Collection in 1905. Doubting that this species actually occurs in Trinidad, the author checked under the specimen numbers in the Fry Collection catalogue and found that this material had been collected in "Trinidad *and Grenada*". This was not indicated on the specimen labels, and there can be no doubt that the two specimens of *C. perseverans* were collected on Grenada, to which island this species seems to be an exclusive endemic.

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